Lab 1

Clarissa Boyajian

4/6/2022

First query

```r
# create an object called t with the results of our query ("haaland")
# the from JSON flatten the JSON object, then convert to a data frame
t <- fromJSON(paste0("http://api.nytimes.com/svc/search/v2/articlesearch.json?q=haaland&api-key=",
                     "qTBZr0Mz2Ak8icY1OZTCm0kfxdze9Gnn"), flatten = TRUE) # the string following "q=" i
# the string following "key=" is your API key

class(t) #what type of object is t?
```

```
## [1] "list"
```

```r
t <- t %>%
  data.frame()


# Inspect our data
class(t) #now what is it?
```

```
## [1] "data.frame"
```

```r
dim(t) # how big is it?
```

```
## [1] 10 33
```

```r
  # if prints: 10 33 - means 10 articles with 33 variables (ex: lead paragraph, key words, etc.)
names(t) # what variables are we working with?
```

```
##  [1] "status"
##  [2] "copyright"
##  [3] "response.docs.abstract"
##  [4] "response.docs.web_url"
##  [5] "response.docs.snippet"
##  [6] "response.docs.lead_paragraph"
##  [7] "response.docs.source"
##  [8] "response.docs.multimedia"
##  [9] "response.docs.keywords"
```

```
## [10] "response.docs.pub_date"
## [11] "response.docs.document_type"
## [12] "response.docs.news_desk"
## [13] "response.docs.section_name"
## [14] "response.docs.type_of_material"
## [15] "response.docs._id"
## [16] "response.docs.word_count"
## [17] "response.docs.uri"
## [18] "response.docs.print_section"
## [19] "response.docs.print_page"
## [20] "response.docs.subsection_name"
## [21] "response.docs.headline.main"
## [22] "response.docs.headline.kicker"
## [23] "response.docs.headline.content_kicker"
## [24] "response.docs.headline.print_headline"
## [25] "response.docs.headline.name"
## [26] "response.docs.headline.seo"
## [27] "response.docs.headline.sub"
## [28] "response.docs.byline.original"
## [29] "response.docs.byline.person"
## [30] "response.docs.byline.organization"
## [31] "response.meta.hits"
## [32] "response.meta.offset"
## [33] "response.meta.time"
```

```r
#t <- readRDS("nytDat.rds") #in case of API emergency
```

```r
# snippet = NYTimes thing
# snippet = one sentence pulled from article (not summary or anything)
t$response.docs.snippet[9]
```

```
## [1] "Her nomination as secretary of the interior is historic, but as the first Native cabinet member
```

```r
# assign a snippet to x to use as fodder for `stringr` functions.  You can follow along using the sente

x <- "Her nomination as secretary of the interior is historic, but as the first Native cabinet member, s

tolower(x) # helpful if you don't want "Her" to be considered different than "her"
```

```
## [1] "her nomination as secretary of the interior is historic, but as the first native cabinet member
```

```r
# split string by commas
str_split(x, ',');
```

```
## [[1]]
## [1] "Her nomination as secretary of the interior is historic"
## [2] " but as the first Native cabinet member"
## [3] " she would have to strike a delicate balance."
```

```r
# split string at "t"s
# notice what you split by isn't included
str_split(x, 't')
```

```
## [[1]]
##  [1] "Her nomina"            "ion as secre"
##  [3] "ary of "               "he in"
##  [5] "erior is his"          "oric, bu"
##  [7] " as "                  "he firs"
##  [9] " Na"                   "ive cabine"
## [11] " member, she would have " "o s"
## [13] "rike a delica"         "e balance."
```

```r
# "historic" with "without precedent"
str_replace(x, 'historic', 'without precedent')
```

```
## [1] "Her nomination as secretary of the interior is without precedent, but as the first Native cabine
```

```r
# replace first white spaces with "_"
str_replace(x, ' ', '_') #first one
```

```
## [1] "Her_nomination as secretary of the interior is historic, but as the first Native cabinet member
```

```r
# how do we replace all of them?
str_replace_all(x, ' ', '_')
```

```
## [1] "Her_nomination_as_secretary_of_the_interior_is_historic,_but_as_the_first_Native_cabinet_member
```

```r
str_detect(x, 't'); str_detect(x, 'tive') ### is pattern in the string? T/F
```

```
## [1] TRUE
```

```
## [1] TRUE
```

```r
str_locate(x, 't'); str_locate_all(x, 'as')
```

```
##      start end
## [1,]    11  11
```

```
## [[1]]
##      start end
## [1,]    16  17
## [2,]    62  63
```

Bigger query

```r
term <- "Haaland" # use + to string together separate words
begin_date <- "20210120" # YYYYMMDD
end_date <- "20220401" # YYYYMMDD

# construct the query url using API operators
baseurl <- paste0("http://api.nytimes.com/svc/search/v2/articlesearch.json?q=", term,
                  "&begin_date=", begin_date,
                  "&end_date=", end_date,
                  "&facet_filter=true&api-key=", "qTBZr0Mz2Ak8icY1OZTCm0kfxdze9Gnn",
                  sep = "")
```

```r
# this code allows for obtaining multiple pages of query results (each search maxes out at 10 pages for
initialQuery <- fromJSON(baseurl)

maxPages <- round((initialQuery$response$meta$hits[1] / 10) - 1)

pages <- list()
for(i in 0:maxPages){
  nytSearch <- fromJSON(paste0(baseurl, "&page=", i), flatten = TRUE) %>%
    data.frame()
  message("Retrieving page ", i)
  pages[[i + 1]] <- nytSearch
  Sys.sleep(6) # keeps you from hitting limit for API
}
```

```
## Retrieving page 0

## Retrieving page 1

## Retrieving page 2

## Retrieving page 3

## Retrieving page 4

## Retrieving page 5

## Retrieving page 6

## Retrieving page 7

## Retrieving page 8

## Retrieving page 9

## Retrieving page 10

## Retrieving page 11
```

```r
class(nytSearch)
```

```
## [1] "data.frame"
```

```r
# need to bind the pages and create a tibble from nytDa
nytDat <- rbind_pages(pages)
```

```r
nytDat %>%
  group_by(response.docs.type_of_material) %>%
  summarize(count = n()) %>%
  mutate(percent = (count / sum(count)) * 100) %>%
  ggplot() +
  geom_bar(aes(y = percent,
               x = response.docs.type_of_material,
               fill = response.docs.type_of_material),
           stat = "identity") +
  coord_flip() +
  labs(fill = "Material Types")
```
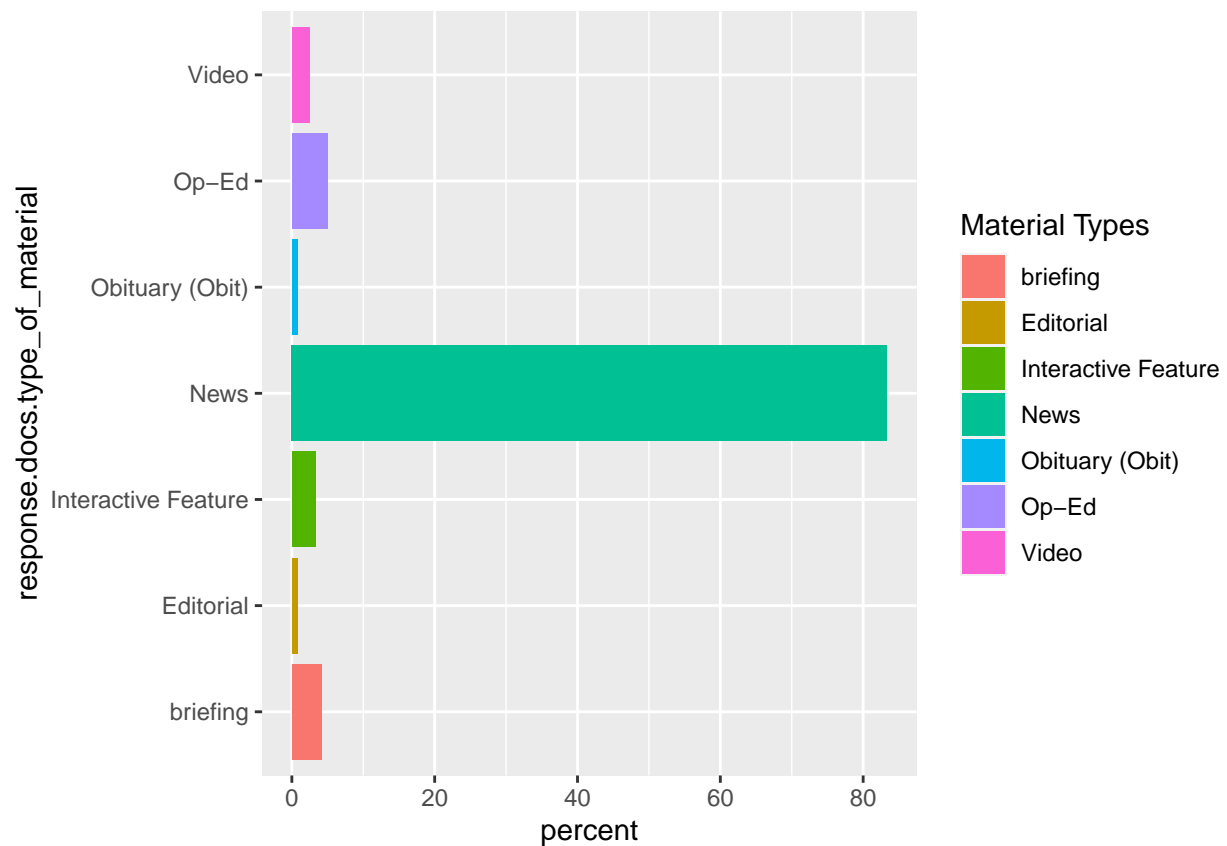


```r
nytDat %>%
  mutate(pubDay = gsub("T.*", "", response.docs.pub_date)) %>% # replace "T." with "" - remove time but
  group_by(pubDay) %>%
  summarise(count = n()) %>%
  filter(count >= 2) %>%
  ggplot() +
  geom_bar(aes(x = reorder(pubDay, count),
               y = count),
           stat = "identity") +
  coord_flip()
```
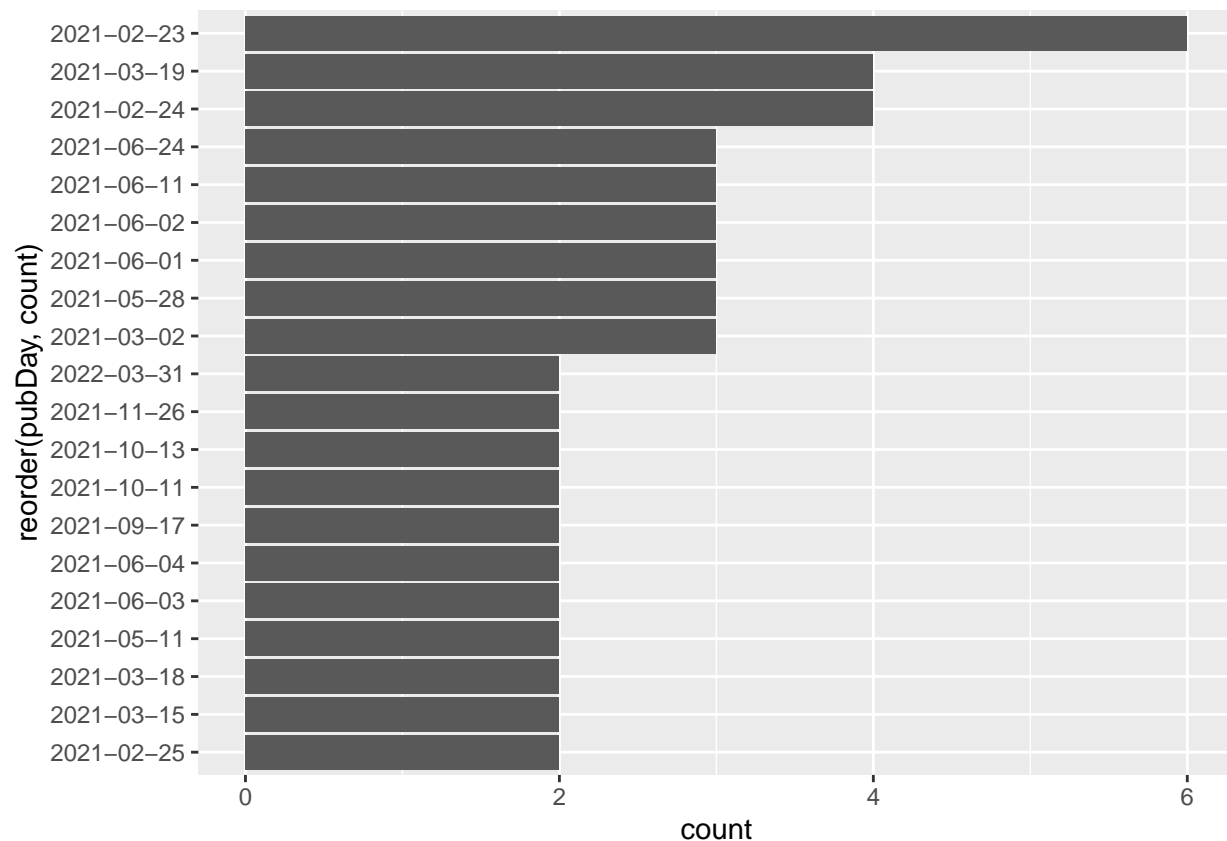
```
names(nytDat) # look at variables
```

```
##  [1] "status"
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##  [3] "response.docs.abstract"
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## [31] "response.meta.hits"
## [32] "response.meta.offset"
## [33] "response.meta.time"
```

```r
paragraph <- names(nytDat)[6] # call the 6th column ("response.doc.lead_paragraph")

# convert from text to `tidytext` format
tokenized <- nytDat %>%
  unnest_tokens(word, paragraph) # here: take paragraphs in and un-nest to word level (1 row for each w

tokenized %>%
  count(word, sort = TRUE) %>%
  filter(n > 5) %>% # illegible with all the words displayed
  mutate(word = reorder(word, n)) %>%
  ggplot(aes(n, word)) +
  geom_col() +
  labs(y = NULL,
       x = "Number of times word appears")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <e2>
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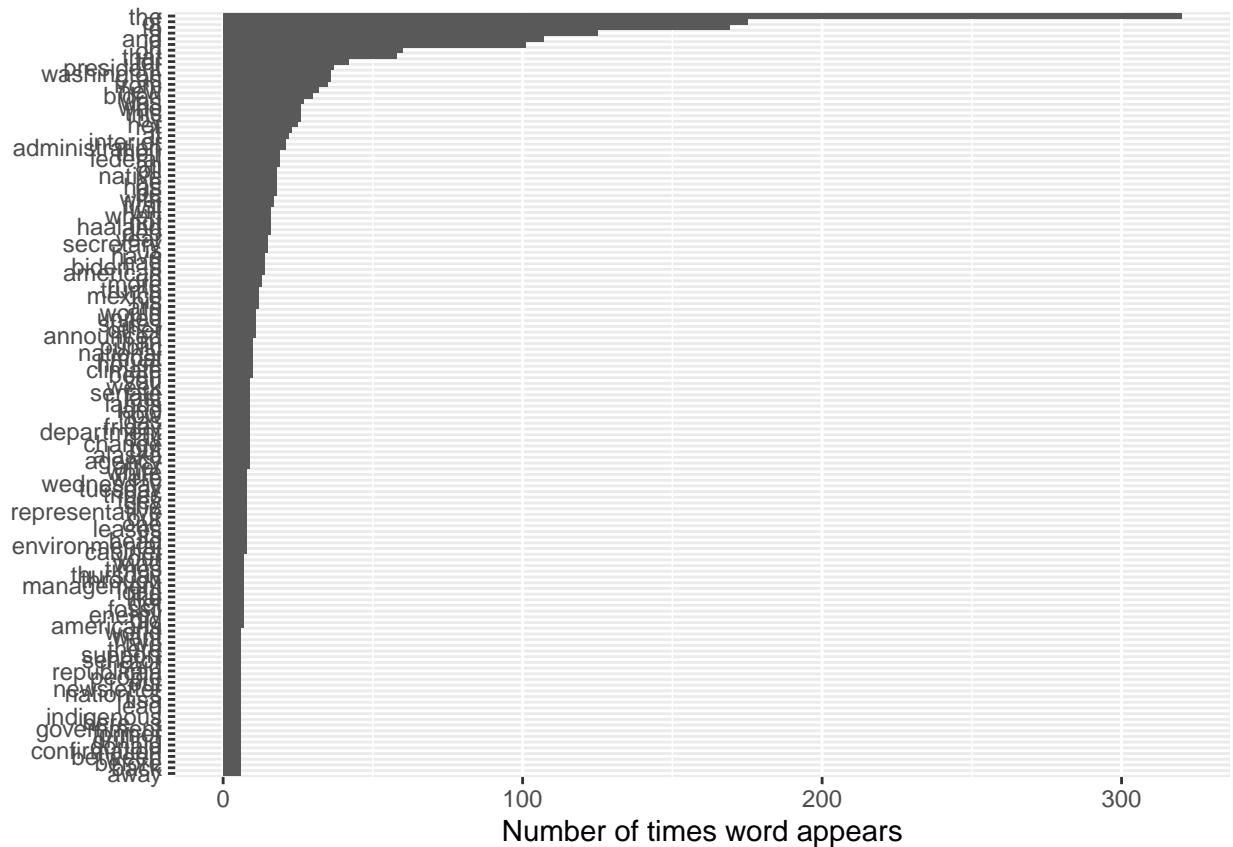
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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>

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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <80>

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```

Number of times word appears

```r
# `tidytext` has list of common stopwords in English language
data(stop_words) # pull data object from `tidytext` package
stop_words # viwe list of stopwords
```

```
## # A tibble: 1,149 x 2
##    word        lexicon
##    <chr>       <chr>
##  1 a           SMART
##  2 a's         SMART
##  3 able        SMART
##  4 about       SMART
##  5 above       SMART
##  6 according   SMART
##  7 accordingly SMART
##  8 across      SMART
##  9 actually    SMART
## 10 after       SMART
## # ... with 1,139 more rows
```

```r
tokenized <- tokenized %>%
  anti_join(stop_words) # remove all rows that match a stopword
```

```
## Joining, by = "word"
```

```
tokenized %>%
  count(word, sort = TRUE) %>%
  filter(n > 5) %>%
  mutate(word = reorder(word, n)) %>%
  ggplot(aes(n, word)) +
  geom_col() +
  labs(y = NULL,
       x = "Number of times word appears")
```

```
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```
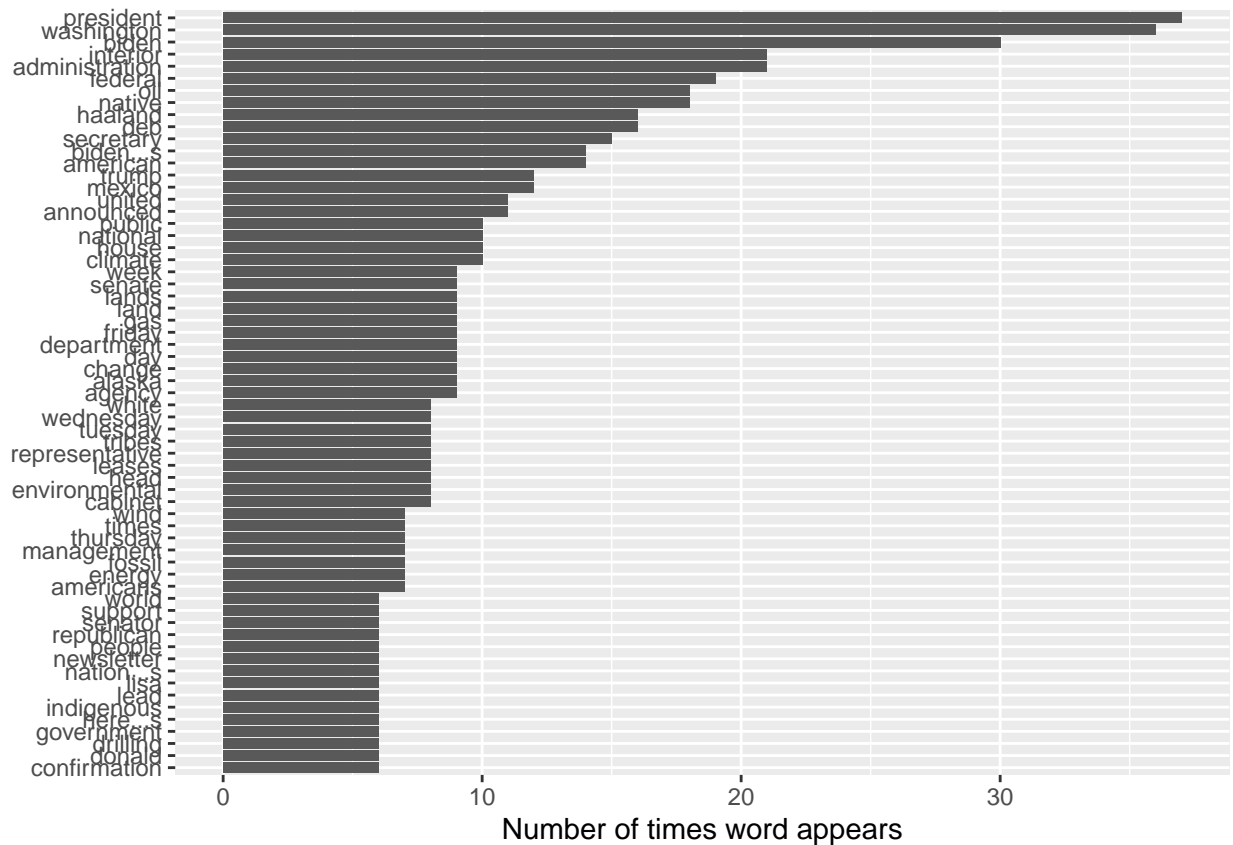
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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>

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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>

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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <e2>
```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

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## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>

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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <80>

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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

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## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

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## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <80>

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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>

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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>
```

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## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

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## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>


## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <e2>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <80>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'here's' in 'mbcsToSbcs': dot substituted for <99>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <e2>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'nation's' in 'mbcsToSbcs': dot substituted for <80>


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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <e2>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <80>


## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on 'biden's' in 'mbcsToSbcs': dot substituted for <99>
```

Number of times word appears

```
#inspect the list of tokens (words)
tokenized$word # still have not useful tokens
```

```
##    [1] "map"            "dots"             "resembling"
##    [4] "scattergram"    "america"          "snow"
##    [7] "covered"        "pinnacles"        "remote"
##   [10] "islands"        "washington"       "united"
##   [13] "government"     "netted"           "record"
##   [16] "4.37"           "billion"          "friday"
##   [19] "sale"           "offshore"         "wind"
##   [22] "leases"         "coasts"           "york"
##   [25] "jersey"         "major"            "step"
##   [28] "biden"          "administration's" "goal"
##   [31] "ushering"       "future"           "powered"
##   [34] "renewable"      "energy"           "day"
##   [37] "incoming"       "manager"          "club"
##   [40] "overwhelming"   "entire"           "squad"
##   [43] "players"        "meet"             "win"
##   [46] "staff"          "nervous"          "intentions"
##   [49] "fearful"        "future"           "hold"
##   [52] "convince"       "command"          "washington"
##   [55] "interior"       "department"       "friday"
##   [58] "recommended"    "federal"          "government"
##   [61] "raise"          "fees"             "oil"
##   [64] "gas"            "companies"        "pay"
```

```
##    [67] "drill"            "public"           "lands"
##    [70] "increase"         "rent"             "royalty"
##    [73] "rates"            "1920"             "washington"
##    [76] "decision"         "trump"            "administration"
##    [79] "move"             "headquarters"     "bureau"
##    [82] "land"             "management"       "grand"
##    [85] "junction"         "colo"             "washington"
##    [88] "left"             "agency"           "vacancy"
##    [91] "rates"            "veteran"          "employees"
##    [94] "african"          "americans"        "quit"
##    [97] "relocate"         "government"       "watchdog"
##   [100] "report"           "issued"           "week"
##   [103] "darkened"         "erling"           "haaland"
##   [106] "watching"         "injury"           "meant"
##   [109] "field"            "norway's"         "significant"
##   [112] "match"            "20"               "netherlands"
##   [115] "return"           "partial"          "lockdown"
##   [118] "weekend"          "meant"            "game"
##   [121] "played"           "closed"           "doors"
##   [124] "support"          "national"         "team"
##   [127] "stands"           "washington"       "president"
##   [130] "biden"            "announced"        "monday"
##   [133] "administration"   "moving"           "block"
##   [136] "federal"          "oil"              "gas"
##   [139] "leasing"          "10"               "mile"
##   [142] "radius"           "chaco"            "canyon"
##   [145] "mexico"           "nation's"         "culturally"
##   [148] "significant"      "native"           "american"
##   [151] "sites"            "deb"              "haaland"
##   [154] "president"        "biden's"          "secretary"
##   [157] "interior"         "year's"           "recognizable"
##   [160] "amateur"          "runners"          "forget"
##   [163] "pantsuit"         "nation"           "washington"
##   [166] "dress"            "code"             "changing"
##   [169] "swearing"         "time"             "washington"
##   [172] "senator"          "joe"              "manchin"
##   [175] "iii"              "west"             "virginia"
##   [178] "democrat"         "heads"            "senate"
##   [181] "energy"           "committee"        "announced"
##   [184] "wednesday"        "vote"             "confirm"
##   [187] "representative"   "deb"              "haaland"
##   [190] "mexico"           "head"             "interior"
##   [193] "department"       "ensuring"         "president"
##   [196] "biden's"          "embattled"        "cabinet"
##   [199] "nominees"         "confirmed"        "office"
##   [202] "escalating"       "opposition"       "republicans"
##   [205] "senate"           "approved"         "representative"
##   [208] "deb"              "haaland"          "mexico"
##   [211] "lead"             "interior"         "department"
##   [214] "native"           "american"         "lead"
##   [217] "cabinet"          "agency"           "thursday"
##   [220] "deb"              "haaland"          "history"
##   [223] "job"              "secretary"        "interior"
##   [226] "native"           "american"         "lead"
```

```
##  [229] "cabinet"          "level"             "agency"
##  [232] "washington"       "interior"          "secretary"
##  [235] "deb"              "haaland"           "advised"
##  [238] "president"        "biden"             "restore"
##  [241] "sweeping"         "environmental"     "protections"
##  [244] "major"            "national"          "monuments"
##  [247] "stripped"         "president"         "donald"
##  [250] "trump"            "weekend"           "listen"
##  [253] "collection"       "narrated"          "articles"
##  [256] "york"             "times"             "read"
##  [259] "aloud"            "reporters"         "wrote"
##  [262] "story"            "danger"            "bubbled"
##  [265] "surface"          "audible"           "intake"
##  [268] "breath"           "manchester"        "city's"
##  [271] "substitutes"      "passed"            "exchanged"
##  [274] "glances"          "admiration"        "relief"
##  [277] "murmur"           "appreciation"      "silence"
##  [280] "stadium"          "hear"              "sounds"
##  [283] "game"             "recognizing"       "game"
##  [286] "washington"       "biden"             "administration"
##  [289] "announced"        "wednesday"         "plan"
##  [292] "develop"          "scale"             "wind"
##  [295] "farms"            "entire"            "coastline"
##  [298] "united"           "term"              "strategy"
##  [301] "government"       "produce"           "electricity"
##  [304] "offshore"         "turbines"          "representative"
##  [307] "deb"              "haaland"           "mexico"
##  [310] "president"        "biden's"           "pick"
##  [313] "head"             "interior"          "department"
##  [316] "sought"           "tuesday"           "line"
##  [319] "past"             "remarks"           "activist"
##  [322] "opposing"         "fossil"            "fuel"
##  [325] "industry"         "prospective"       "role"
##  [328] "helm"             "agency"            "oversees"
##  [331] "drilling"         "conservation"      "nation's"
##  [334] "500"              "million"           "acres"
##  [337] "public"          "land"              "senate"
##  [340] "committee"        "thursday"          "approved"
##  [343] "deb"              "haaland"           "secretary"
##  [346] "interior"         "support"           "senator"
##  [349] "lisa"             "murkowski"         "alaska"
##  [352] "key"              "republican"        "oil"
##  [355] "producing"        "virtually"         "ensuring"
##  [358] "confirmation"     "senate"            "month"
##  [361] "senator"          "joe"               "manchin"
##  [364] "iii"              "west"              "virginia"
##  [367] "democrat"         "heads"             "senate"
##  [370] "energy"           "committee"         "announced"
##  [373] "wednesday"        "vote"              "confirm"
##  [376] "representative"   "deb"               "haaland"
##  [379] "mexico"           "head"              "interior"
##  [382] "department"       "washington"        "president"
##  [385] "biden"            "announced"         "friday"
##  [388] "executive"        "authority"         "restore"
```

```
## [391] "sweeping"          "environmental"    "protections"
## [394] "major"             "national"         "monuments"
## [397] "stripped"          "president"        "donald"
## [400] "trump"             "washington"       "representative"
## [403] "deb"               "haaland"          "mexico"
## [406] "history"           "monday"           "senate"
## [409] "confirmed"         "president"        "biden's"
## [412] "secretary"         "interior"         "native"
## [415] "american"          "lead"             "cabinet"
## [418] "agency"            "hear"             "audio"
## [421] "stories"           "publications"     "york"
## [424] "times"             "download"         "audm"
## [427] "iphone"            "android"          "washington"
## [430] "representative"    "deb"              "haaland"
## [433] "tapped"            "december"         "president"
## [436] "biden's"           "interior"         "secretary"
## [439] "decision"          "hailed"           "historic"
## [442] "native"            "american"         "nominated"
## [445] "serve"             "cabinet"          "head"
## [448] "department"        "nation's"         "history"
## [451] "mistreated"        "neglected"        "indigenous"
## [454] "americans"         "washington"       "biden"
## [457] "administration"    "wednesday"        "restored"
## [460] "protections"       "migratory"        "birds"
## [463] "loosened"          "president"        "donald"
## [466] "trump"             "move"             "celebrated"
## [469] "conservationists"  "expected"         "exacerbate"
## [472] "tensions"          "administration"   "oil"
## [475] "gas"               "industry"         "interior"
## [478] "secretary"         "deb"              "haaland"
## [481] "announced"         "friday"           "bureau"
## [484] "land"              "management"       "move"
## [487] "headquarters"      "washington"       "reversal"
## [490] "heavily"           "criticized"       "trump"
## [493] "administration"    "decision"         "relocate"
## [496] "public"            "lands"            "agency"
## [499] "grand"             "junction"         "colo"
## [502] "washington"        "peering"          "sea"
## [505] "white"             "flags"            "blanketing"
## [508] "national"          "mall"             "dr"
## [511] "laura"             "valleni"          "recalled"
## [514] "scores"            "pregnant"         "women"
## [517] "contracted"        "coronavirus"      "hospital"
## [520] "south"             "carolina"         "babies"
## [523] "born"              "prematurely"      "mothers"
## [526] "died"              "surge"            "children"
## [529] "overwhelmed"       "pediatric"        "unit"
## [532] "past"              "months"           "phoenix"
## [535] "politics"          "issues"           "true"
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##   [712]  "top"              "posts"            "remained"
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## [874] "jerome"          "powell"            "chair"
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## [1729] "land"            "management"      "capping"
## [1732] "months"          "efforts"         "republican"
## [1735] "lawmakers"       "block"           "confirmation"
## [1738] "connection"      "decades"         "tree"
## [1741] "spiking"         "incident"        "gray"
## [1744] "wolves"          "regain"          "federal"
## [1747] "protection"      "lower"           "48"
## [1750] "united"          "court"           "ruling"
## [1753] "thursday"        "struck"          "trump"
## [1756] "administration"  "decision"        "animals"
## [1759] "endangered"      "species"         "list"
## [1762] "congress"        "tuesday"         "threatened"
## [1765] "withhold"        "tens"            "millions"
## [1768] "dollars"         "federal"         "funding"
## [1771] "native"          "american"        "tribes"
## [1774] "oklahoma"        "adding"          "renewed"
## [1777] "public"          "pressure"        "policies"
## [1780] "discriminate"    "descendants"     "black"
## [1783] "people"          "enslaved"        "tribes"
## [1786] "civil"           "war"             "federal"
## [1789] "board"           "thursday"        "approved"
## [1792] "renaming"        "16"              "sites"
## [1795] "texas"           "names"           "include"
## [1798] "word"            "negro"           "change"
## [1801] "sought"          "politicians"     "activists"
## [1804] "affect"          "fraction"        "hundreds"
## [1807] "racist"          "names"           "towns"
## [1810] "geographical"    "features"        "remain"
## [1813] "united"          "follow"          "news"
## [1816] "week"            "quiz"            "stack"
## [1819] "times"           "readers"         "kathryn"
## [1822] "dunn"            "tenpas"          "senior"
## [1825] "fellow"          "university"      "virginia's"
## [1828] "miller"          "center"          "washington"
## [1831] "federal"         "judge"           "thursday"
## [1834] "canceled"        "oil"             "gas"
## [1837] "leases"          "80"              "million"
## [1840] "acres"           "gulf"            "mexico"
## [1843] "ruling"          "biden"           "administration"
## [1846] "sufficiently"    "climate"         "change"
```

```
## [1849] "account"         "auctioned"      "leases"
## [1852] "late"            "washington"     "biden"
## [1855] "administration"  "friday"         "announced"
## [1858] "begin"           "formal"         "process"
## [1861] "selling"         "leases"         "develop"
## [1864] "offshore"        "wind"           "farms"
## [1867] "shallow"         "waters"         "island"
## [1870] "jersey"          "push"           "transition"
## [1873] "nation"          "renewable"      "energy"
## [1876] "sunday"          "puzzle"         "visually"
## [1879] "unusual"         "challenge"      "excellent"
## [1882] "constructors"    "matthew"        "stock"
## [1885] "nediger"         "collaborating"  "time"
## [1888] "york"            "times"          "puzzle's"
## [1891] "print"           "introduction"   "connected"
## [1894] "online"          "developed"      "theme"
## [1897] "conceived"       "stock"          "direct"
## [1900] "messages"        "twitter"        "swapping"
## [1903] "grids"           "happy"          "meet"
## [1906] "video"           "pride"          "celebrations"
## [1909] "june"            "marches"        "parades"
## [1912] "parties"         "trace"          "histories"
## [1915] "fiery"           "street"         "demonstration"
## [1918] "1970"            "violent"        "uprising"
## [1921] "stonewall"       "inn"            "manhattan"
## [1924] "galvanized"      "modern"         "gay"
## [1927] "rights"          "movement"       "european"
## [1930] "championship"    "considered"     "biggest"
## [1933] "soccer"          "tournament"     "world"
## [1936] "cup"             "held"           "summer"
## [1939] "year's"          "delay"          "coronavirus"
## [1942] "pandemic"        "here's"         "rundown"
## [1945] "teams"           "players"        "host"
## [1948] "cities"          "called"         "euro"
## [1951] "2020"            "ocean"          "rises"
## [1954] "homeowners"      "avon"           "tiny"
## [1957] "town"            "outer"          "banks"
## [1960] "north"           "carolina"       "confronting"
## [1963] "tax"             "increase"       "50"
## [1966] "percent"         "defend"         "road"
## [1969] "town"            "residents"      "pay"
## [1972] "local"           "officials"      "they're"
## [1975] "decades"         "ago"            "zealand"
## [1978] "highway"         "authority"      "planning"
## [1981] "waikato"         "expressway"     "people"
## [1984] "māori"           "tribe"          "ngāti"
## [1987] "naho"            "objected"       "highway"
## [1990] "encroach"        "māori"          "tradition"
## [1993] "governed"        "water"          "dwelling"
## [1996] "creature"        "taniwha"        "world"
## [1999] "cup"             "draw"           "set"
## [2002] "field"           "invitation"     "list"
## [2005] "year's"          "tournament"     "qatar"
## [2008] "isn't"           "complete"       "teams"
```

```
## [2011] "play"         "plenty"          "questions"
## [2014] "play"         "soccer's"        "winter"
## [2017] "world"        "cup"             "here's"
## [2020] "primer"       "world's"         "sporting"
## [2023] "spectacle"    "president"       "biden"
## [2026] "proclaimed"   "monday"          "oct"
## [2029] "11"           "indigenous"      "peoples"
## [2032] "day"          "u.s"             "president"
## [2035] "formally"     "recognize"       "day"
## [2038] "biden"        "administration"  "defended"
## [2041] "contentious"  "pipeline"        "project"
## [2044] "carry"        "hundreds"        "thousands"
## [2047] "barrels"      "oil"             "minnesota's"
## [2050] "delicate"     "watersheds"      "urging"
## [2053] "court"        "challenge"       "brought"
## [2056] "local"        "tribes"          "environmental"
## [2059] "thrown"       "northern"        "branch"
## [2062] "gulf"         "stream"          "vast"
## [2065] "ocean"        "current"         "runs"
## [2068] "west"         "africa"          "americas"
## [2071] "east"         "coast"           "atlantic"
## [2074] "british"      "isles"           "served"
## [2077] "ages"         "planetary"       "heat"
## [2080] "pump"         "helps"           "regulate"
## [2083] "planet's"     "climate"         "politics"
## [2086] "wrap"         "week"            "national"
## [2089] "politics"     "i'm"             "lisa"
## [2092] "lerer"        "host"            "washington"
## [2095] "president"    "biden"           "forced"
## [2098] "hold"         "lease"           "sale"
## [2101] "oil"          "drilling"        "pristine"
## [2104] "arctic"       "national"        "wildlife"
## [2107] "refuge"       "vows"            "slash"
## [2110] "fossil"       "fuel"            "pollution"
## [2113] "action"       "week"            "suspend"
## [2116] "arctic"       "drilling"        "leases"
## [2119] "awarded"      "final"           "days"
## [2122] "trump"        "administration"  "construction"
## [2125] "nation's"     "commercial"      "scale"
## [2128] "offshore"     "wind"            "farm"
## [2131] "expected"     "begin"           "summer"
## [2134] "biden"        "administration"  "final"
## [2137] "approval"     "tuesday"         "project"
## [2140] "hopes"        "herald"          "era"
## [2143] "wind"         "energy"          "united"
## [2146] "albuquerque"  "mexican"         "officials"
## [2149] "message"      "farmers"         "depend"
## [2152] "irrigation"   "water"           "rio"
## [2155] "grande"       "rivers"          "absolutely"
## [2158] "plant"        "don't"           "morning"
## [2161] "washington"   "biden"           "administration"
## [2164] "defending"    "huge"            "trump"
## [2167] "era"          "oil"             "gas"
## [2170] "project"      "north"           "slope"
```

```
## [2173] "alaska"          "designed"          "produce"
## [2176] "100,000"         "barrels"           "oil"
## [2179] "day"             "30"                "president"
## [2182] "biden's"         "pledge"            "pivot"
## [2185] "country"         "fossil"            "fuels"
## [2188] "public"          "figures"           "crept"
## [2191] "spotlight"       "tiptoe"            "doors"
## [2194] "presidential"    "inauguration"      "socially"
## [2197] "distanced"       "red"               "carpet"
## [2200] "oscars"          "throttle"          "ball"
## [2203] "gowns"           "max"               "explosion"
## [2206] "pent"            "dressing"          "cannes"
## [2209] "film"            "festival"          "compensate"
## [2212] "previous"        "enforced"          "isolation"
## [2215] "newsletter"      "inbox"             "here's"
## [2218] "sign"            "month"             "ago"
## [2221] "school"          "board"             "northern"
## [2224] "jersey"          "suburb"            "lead"
## [2227] "scores"          "municipalities"    "voted"
## [2230] "unanimously"     "rename"            "columbus"
## [2233] "day"             "indigenous"        "peoples"
## [2236] "day"             "newsletter"        "inbox"
## [2239] "here's"          "sign"              "newsletter"
## [2242] "inbox"           "here's"            "sign"
## [2245] "washington"      "notion"            "wind"
## [2248] "farms"           "churning"          "pacific"
## [2251] "ocean"           "creating"          "clean"
## [2254] "energy"          "power"             "homes"
## [2257] "businesses"      "dismissed"         "logistical"
## [2260] "challenges"      "posed"             "deep"
## [2263] "ocean"           "floor"             "opposition"
## [2266] "military"        "prefers"           "obstacles"
## [2269] "navy"            "ships"             "newsletter"
## [2272] "inbox"           "here's"            "sign"
## [2275] "washington"      "president"         "biden"
## [2278] "wednesday"       "draw"              "350"
## [2281] "billion"         "federal"           "stimulus"
## [2284] "money"           "shore"             "police"
## [2287] "departments"     "vowed"             "crack"
## [2290] "gun"             "dealers"           "fail"
## [2293] "run"             "background"        "checks"
## [2296] "white"           "house"             "seeks"
## [2299] "combat"          "alarming"          "rise"
## [2302] "homicide"        "rates"             "america's"
## [2305] "cities"          "washington"        "president"
## [2308] "biden"           "nominated"         "judge"
## [2311] "ketanji"         "brown"             "jackson"
## [2314] "prestigious"     "appeals"           "court"
## [2317] "senator"         "lisa"              "murkowski"
## [2320] "alaska"          "centrist"          "willingness"
## [2323] "break"           "party"             "republicans"
## [2326] "vote"            "confirm"           "washington"
## [2329] "president"       "biden's"           "nominee"
## [2332] "head"            "office"            "management"
```

```
## [2335] "budget"          "continued"        "senate"
## [2338] "opposition"       "thursday"         "narrowing"
## [2341] "chances"          "confirmation"     "sending"
## [2344] "white"            "house"            "officials"
## [2347] "frantic"          "search"           "republican"
## [2350] "vote"             "salvage"          "nomination"
## [2353] "indian"           "health"           "service"
## [2356] "announced"        "week"             "black"
## [2359] "native"           "americans"        "seminole"
## [2362] "nation"           "freedmen"         "eligible"
## [2365] "health"           "care"             "federal"
## [2368] "agency"           "previously"       "denied"
## [2371] "coronavirus"      "vaccinations"     "care"
## [2374] "washington"       "provided"         "stark"
## [2377] "evidence"         "racial"           "inequities"
## [2380] "lack"             "federal"          "funding"
## [2383] "left"             "tribal"           "communities"
## [2386] "indigenous"       "people"           "vulnerable"
## [2389] "crises"           "pandemic"         "president"
## [2392] "biden"            "democrats"        "congress"
## [2395] "seeking"          "address"          "longstanding"
## [2398] "issues"           "huge"             "infusion"
## [2401] "federal"          "aid"              "selected"
## [2404] "times"            "articles"         "published"
## [2407] "feature"          "stories"          "native"
## [2410] "americans"        "fighting"         "ensure"
## [2413] "representation"   "repatriation"     "recognition"
## [2416] "durango"          "colo"             "day"
## [2419] "dzabahe"          "remembers"        "praying"
## [2422] "ancestors"        "morning"          "1950s"
## [2425] "boarding"         "school"           "don"
## [2428] "alaska"           "congressman"      "secured"
## [2431] "pork"             "barrel"           "billions"
## [2434] "half"             "century"          "serving"
## [2437] "republican"       "house"            "representatives"
## [2440] "current"          "house"            "senate"
## [2443] "died"             "friday"           "88"
## [2446] "northern"         "cheyenne"         "reservation"
## [2449] "mont"             "knock"            "door"
## [2452] "3"                "a.m"              "pauline"
## [2455] "highwolf"         "police"           "officer"
## [2458] "bureau"           "indian"           "affairs"
## [2461] "don't"            "8"                "caught"
## [2464] "eye"              "tall"             "languid"
## [2467] "border"           "rangy"            "ungainly"
## [2470] "moved"            "middle"           "bustle"
## [2473] "hurry"            "unusually"        "sprint"
## [2476] "dash"             "run"              "strolled"
## [2479] "meandered"        "moseyed"          "sign"
## [2482] "rory"             "smith's"          "weekly"
## [2485] "newsletter"       "world"            "soccer"
## [2488] "delivered"        "friday"           "nytimes.com"
## [2491] "rory"             "yellow"           "pine"
## [2494] "idaho"            "net"              "hand"
```

```
## [2497] "louis"              "reuben"              "waded"
## [2500] "frigid"             "waters"              "ancestors"
## [2503] "fished"             "idaho's"             "rivers"
## [2506] "dammed"             "contaminated"        "nez"
## [2509] "perce"              "driven"              "land"
## [2512] "white"              "miners"              "struck"
## [2515] "gold"
```

```r
clean_tokens <- str_replace_all(string = tokenized$word,
                                pattern = "land[a-z, A-Z]*",
                                replacement = "land") # stem tribe words
clean_tokens <- str_remove_all(string = clean_tokens,
                               pattern = "[:digit:]") # remove all numbers
clean_tokens <- str_remove_all(string = clean_tokens,
                               pattern = "washington")
clean_tokens <- gsub("'s", '', clean_tokens)

tokenized$clean <- clean_tokens # put the cleaned tokens into the `tokenized` df `clean` column

tokenized %>%
  count(clean, sort = TRUE) %>%
  filter(n > 10) %>% # illegible with all the words displayed
  mutate(clean = reorder(clean, n)) %>%
  ggplot(aes(n, clean)) +
  geom_col() +
  labs(y = NULL)
```
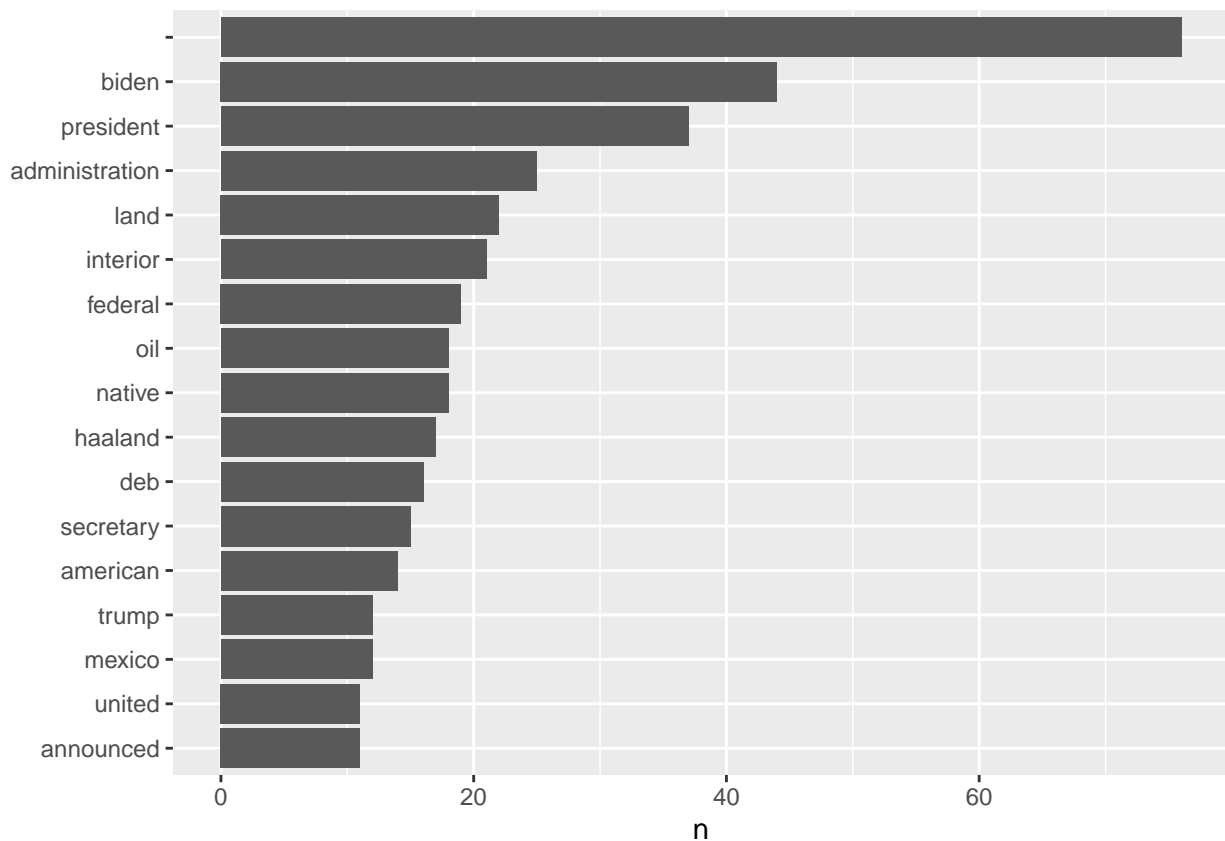
```r
# remove the empty strings
tib <-subset(tokenized, clean != "")

# reassign
tokenized <- tib

#try again
tokenized %>%
  count(clean, sort = TRUE) %>%
  filter(n > 10) %>% # illegible with all the words displayed
  mutate(clean = reorder(clean, n)) %>%
  ggplot(aes(n, clean)) +
  geom_col() +
  labs(y = NULL)
```